

What is claimed is;

1. A method for producing a cushion material composed of a resin molded article having a spring structure, comprising the steps of:

forming a three-dimensional structure with voids at a predetermined bulk density by contacting, entwining, and gathering adjacent ones of random loops or curls of solid and/or hollow continuous filaments and/or short filaments made from a thermoplastic resin;

heating a male die or a female die, or a female die and/or the three-dimensional structure to a temperature sufficiently high to soften the three-dimensional structure;

allowing the male die to intimately contact with the female die so as to tightly compress the three-dimensional structure; and

hardening the three-dimensional structure by cooling.

2. A method as described in Claim 1 for producing a cushion material composed of a resin molded article having a spring structure wherein:

superfluous edges protruded from the three-dimensional structure into the stroke between the two mating dies are cut with a heat cutter so that the edges are cut out and open ends of edge filaments are fused together.

3. A method as described in Claim 1 or 2 for producing a cushion material composed of a resin molded article having a spring structure wherein:

a base to which the resin molded article with a spring structure is attached serves as a male die, and the male die is allowed to intimately contact with a female die so as to tightly compress the three-dimensional structure; and

the three-dimensional structure is hardened by cooling.

4. A cushion material composed of a resin molded article having a spring structure obtained by overlapping two or more layers of sheets each comprising a three-dimensional structure having a same or different spring property, wherein:

the three-dimensional structure is formed by contacting, entwining, and gathering adjacent ones of random loops or curls of solid and/or hollow continuous filaments and/or short filaments made from a thermoplastic resin; and

the three-dimensional structure is heated in a male die or in a female die to a temperature sufficiently high to soften it, compressed via closure of the two mating dies, and allowed to harden by cooling.

5. A cushion material as described in Claim 4 composed of a resin molded article having a spring structure wherein the spring property is determined by the density, material and/or filament diameter of the three-dimensional structure.

6. A cushion material as described in any one of Claims 1 to 3 composed of a resin molded article having a spring structure wherein the volume of the resin molded article with a spring structure can be altered by adjusting stroke of the male die when the female die has a deeply set receptive base.

7. A cushion material as described in any one of Claims 1 to 3 and 6 composed of a resin molded article having a spring structure wherein, out of the two mating dies, at least the female die is made from concrete.

8. A concrete-made female die used for molding a resin molded article with a spring structure which is obtained by preparing a framework according to a master female die effective for molding a resin molded article with a spring structure, pouring concrete paste into the space within the framework, and allowing the concrete paste to harden.

9. A cushion material as described in any one of Claims 1 to 3 and 6 and 7 composed of a resin molded article having a spring structure wherein the vertical movement of at least one of the two mating dies is achieved by a pantograph jack.

10. A cushion material composed of a resin molded article having a spring structure comprising a three-dimensional structure, wherein:

the three-dimensional structure is formed by contacting, entwining, and

gathering adjacent ones of random loops or curls of solid and/or hollow continuous filaments and/or short filaments made from a thermoplastic resin; and

the three-dimensional structure has, on both its top and bottom surfaces, two or more bulges formed on predetermined linear areas by stitching the boundaries of each area using a thread of a thermoplastic resin, and shortening the thread by pressure.

11. A method for producing a cushion material composed of a resin molded article having a spring structure, comprising the steps of:

extruding a melt of a thermoplastic resin into filaments and contacting, entwining, and gathering adjacent ones of random loops or curls of continuous filaments, thereby forming a three-dimensional structure containing voids at a predetermined bulk density;

cutting the periphery of the three-dimensional structure or a resin molded article with a spring structure to give a U- or V-shaped profile, and stitching the thus formed edges with a thread of a thermoplastic resin; and

stitching with a thread of a thermoplastic resin the boundaries of predetermined linear areas on the top and bottom surfaces of the three-dimensional structure, and shortening the thread by pressure.

12. A method as described in Claim 11 for producing a cushion material composed of a resin molded article having a spring structure, comprising the steps of:

placing the three-dimensional structure on a female die;

heating the female die and/or the three-dimensional structure to a temperature sufficiently high to soften the three-dimensional structure;

allowing a male die to intimately contact with the female die so as to tightly compress the three-dimensional structure;

cooling the three-dimensional structure to confer a constant spring property thereto; and

stitching with a thread of a thermoplastic resin the boundaries of predetermined

linear areas on the top and bottom surfaces of the three-dimensional structure, and shortening the thread by pressure.